

What is claimed is:

1. A method of simultaneously writing data to a plurality of tracks of an optical disk, the method comprising:

providing a plurality of writing laser beams;
modulating the writing laser beams according to the data to be written to the corresponding tracks of the optical disk; and

providing an optical system for directing the laser beams to the corresponding tracks of the optical disk,

wherein the plurality of laser beams illuminate spots on the optical disk that are spaced apart by a distance sufficient to prevent thermal interference between data marks being written by nearby beams of the plurality of writing laser beams.

2. The method of claim 1, wherein the distance between spots on the optical disk is minimized to reduce aberrations in the plurality of laser beams.

3. The method of claim 1 wherein the distance between spots is determined by the thermal characteristics of the optical disk.

4. The method of claim 1 wherein the distance between spots is determined by a temperature profile within the disk during a write operation.

5. The method of claim 1 wherein the plurality of spots are aligned linearly at an angle to the tangent of the data tracks of the optical disk.

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6. The method of claim 5 wherein the angle between the line of spots and the tangent is determined by

$$\sin \alpha = k \frac{p}{d}$$

wherein α is the angle, p is the track pitch of the optical disk, d is the minimum distance between writing spots, and k is the difference in track numbers between the tracks being written.

7. The method of claim 1 wherein the distance between writing spots is greater than or equal to about 3.8 μm .

8. The method of claim 6 wherein the optical disk is a CD-type disk and the angle is about 25 degrees.

9. The method of claim 6 wherein the optical disk is a DVD-type disk and the angle is about 11 degrees.

10. Apparatus for simultaneously writing multiple tracks of an optical disk, the apparatus comprising:

a plurality of laser diodes which produce a corresponding plurality of writing laser beams;

a processor coupled to the plurality of laser diodes, the processor modulating the writing beams responsive to data being written to tracks of the optical disk; and

an optical system disposed between the laser diodes and the optical disk, the optical system

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focusing laser beams on, and aligning the laser beams with, corresponding tracks of the optical disk;

wherein each one of the plurality of writing beams produces a writing spot on the optical disk, and wherein adjacent writing spots are spaced apart to prevent thermal interference between data written to the optical disk by adjacent writing spots.

11. The apparatus of claim 10 wherein the distance between spots is determined by the thermal characteristics of the optical disk.

12. The apparatus of claim 10 wherein the distance between spots is determined by a temperature profile within the disk during a write operation.

13. The apparatus of claim 10 wherein the plurality of spots are aligned linearly at an angle to the tangent of the data tracks of the optical disk.

14. The apparatus of claim 13 wherein the angle between the line of spots and the tangent is determined by

$$\sin \alpha = k \frac{p}{d}$$

wherein α is the angle, p is the track pitch of the optical disk, d is the minimum distance between writing spots, and k is the difference in track numbers between the tracks being written.

15. The apparatus of claim 10 wherein the distance between writing spots is greater than or equal to about 3.8 μm .

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16. The apparatus of claim 14 wherein the optical disk is a CD-type disk and the angle is about 25 degrees.

17. The apparatus of claim 14 wherein the optical disk is a DVD-type disk and the angle is about 11 degrees.

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